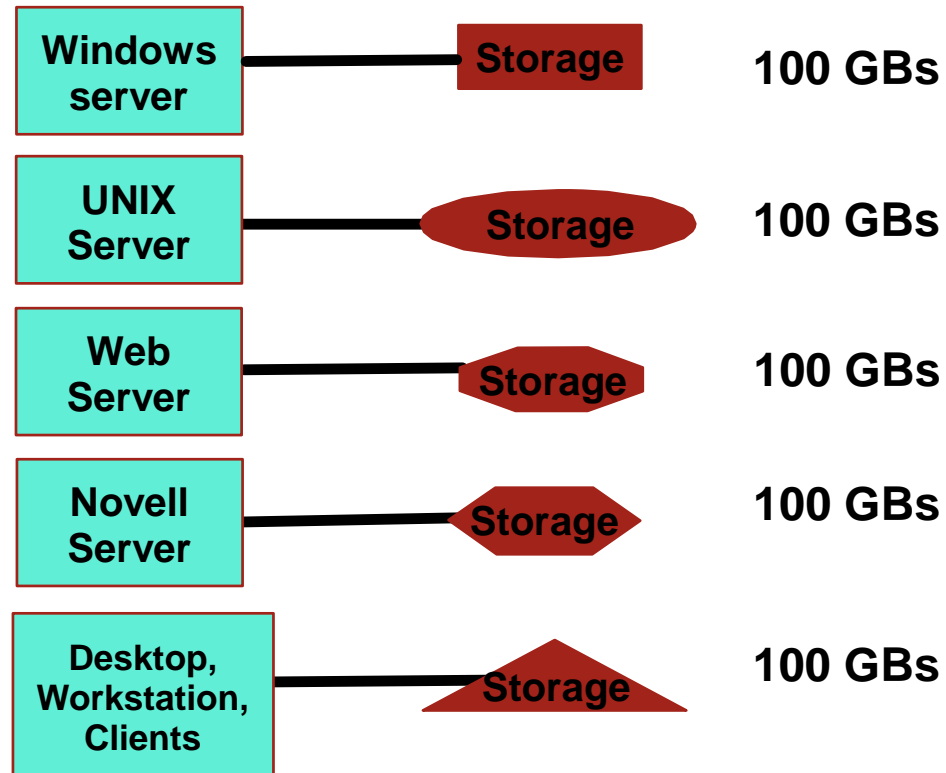


# Demystifying Storage Networking For iSeries



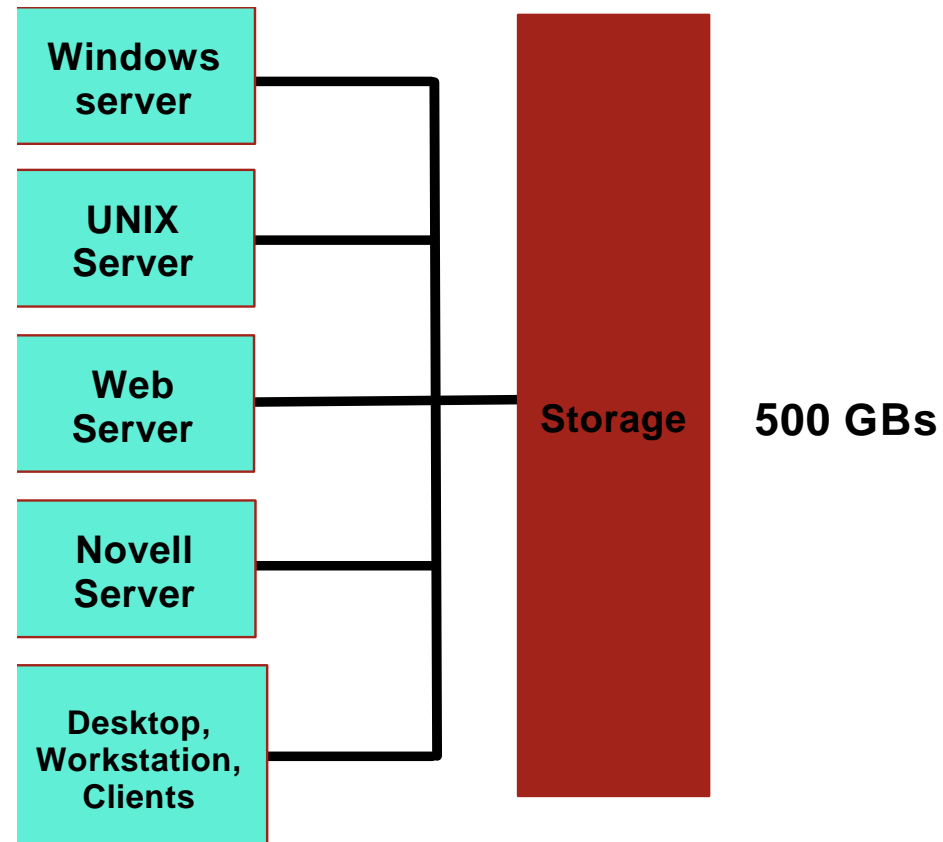
# Storage Networking

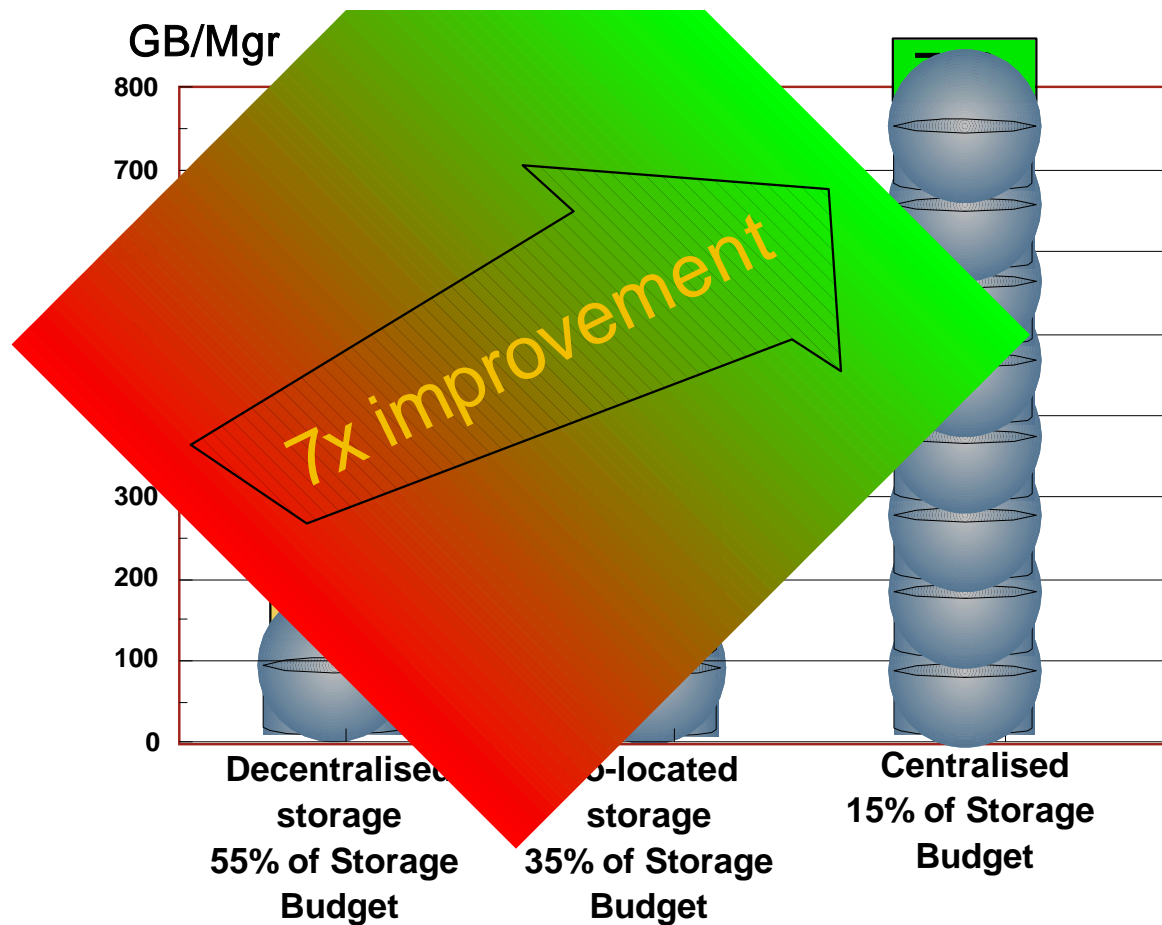
- Disparate Systems



# Storage Networking

- Pooled Storage





**"Major benefit from common management and software"**

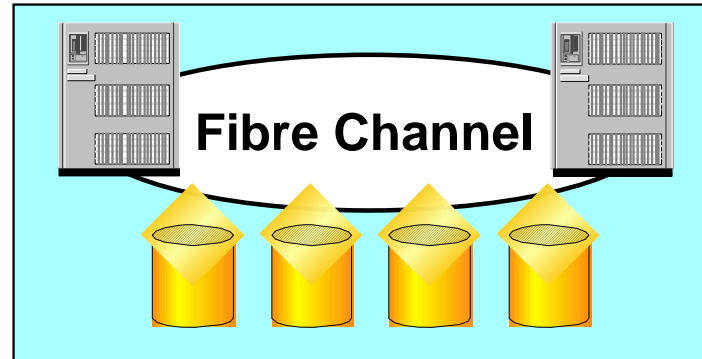
Source: IDC - Planning for Unplanned Explosive Growth

# Storage Types

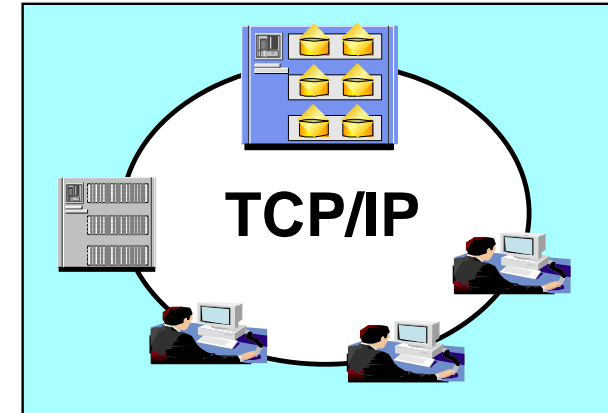
- Direct Attached
- Network Attached Storage
- Storage Area Networks
- Gateways, iSCSI, Storage Virtualisation

# Storage Networking

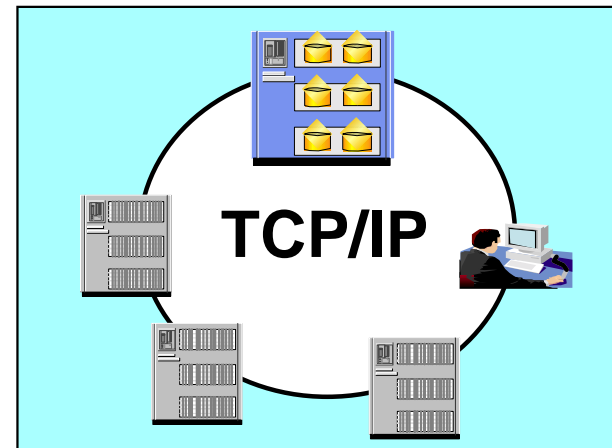
## ● SAN



## ● NAS



## ● iSCSI



# Direct Attached

- Traditional Storage for all server types
- Often difficult to expand or extend
- Server numbers grow
- Increased management overhead
- Difficult to separate file storage from application servers, etc.



# Network Attached Storage

- The most simple solution
- Plug and go
- Software specifically designed purely for file services
- Ranging from pure appliance to fully featured server
- From small to significant capacity





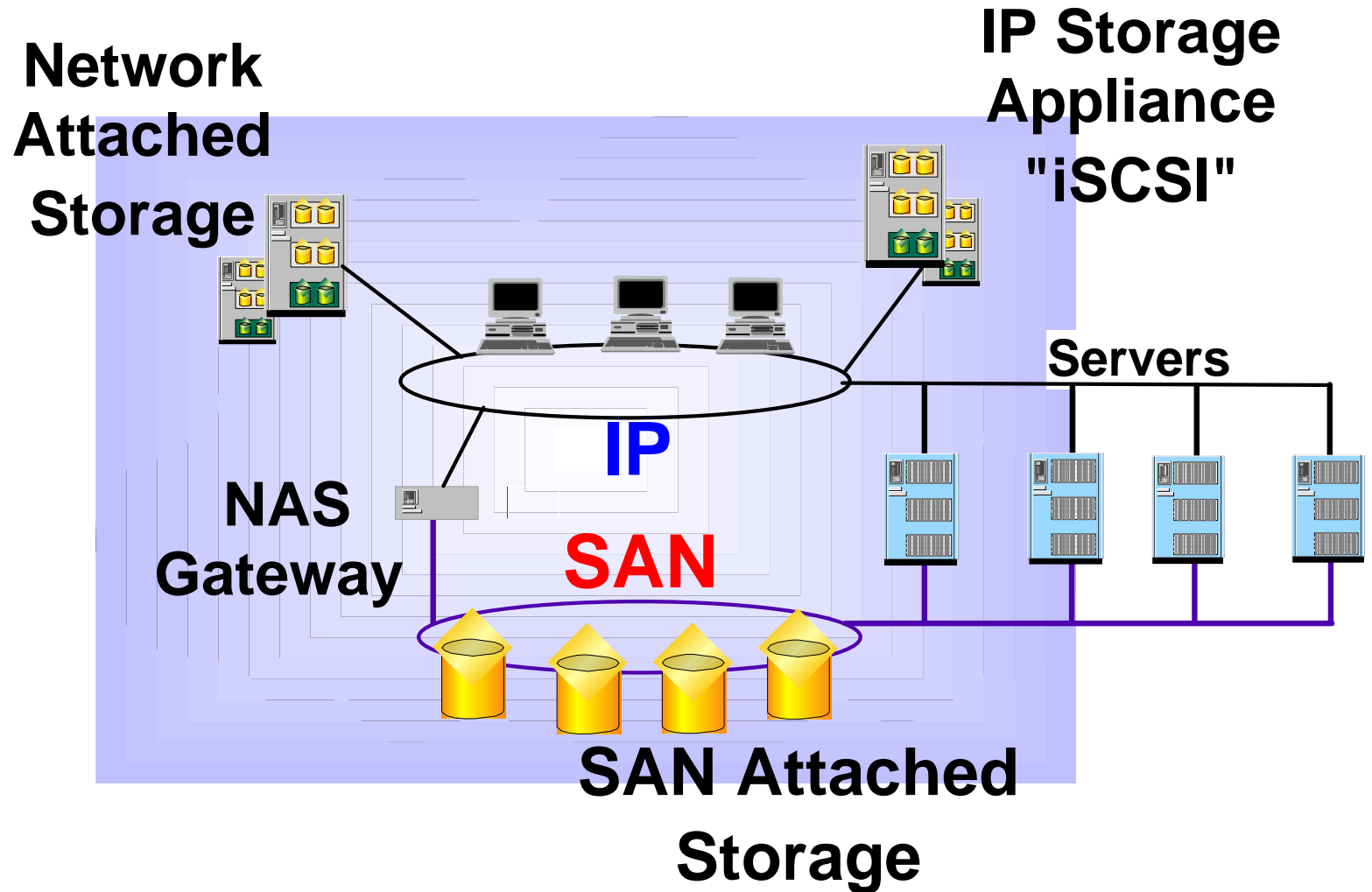
# Storage Area Networks

- More complicated solution
- Utilises different technologies, fibre channel, optical cabling, etc.
- Devices range from small to enterprise scale
- Good server solution
- Relatively expensive

# Associated Technologies

- iSCSI
  - SCSI Commands over client network
- Gateways
  - NAS Devices to SAN backend
- Storage Virtualisation
  - Distributed storage pooled virtually

# Storage Networking



# Connectivity

- Fibre Channel
  - Components commonly available with 2Gb/sec throughput, 1Gb still found in some products
  - Enables a true Storage Area Network
  - Utilises components exactly like a LAN
    - SAN Switches
    - SAN Hubs
    - SAN Data Gateway – allows conversion for SCSI devices

# iSeries Traditional Connectivity

- AS/400 connectivity
  - SCSI Attached
  - Internal
  - EMC
  - SCSI Attached ESS

# iSeries V5R1

- iSeries V5R1
  - First steps towards fibre connectivity
  - 1Gbs
  - Point to Point or Arbitrated Loop
  - Tape Pooling



# iSeries V5R2

- iSeries V5R2
  - 2Gbs
  - Switched Fabric
  - Long Distance Connectivity



# Providing?

- **ESS for system recovery**
  - Both original system and otherwise
- **Flashcopy**
  - Allows replication of entire iSeries DB environment to partition or processor
  - IASPs within a cluster allow copied database to be mounted on another system without IPL
- **OnDemand Disk**
  - Define and add storage on the fly

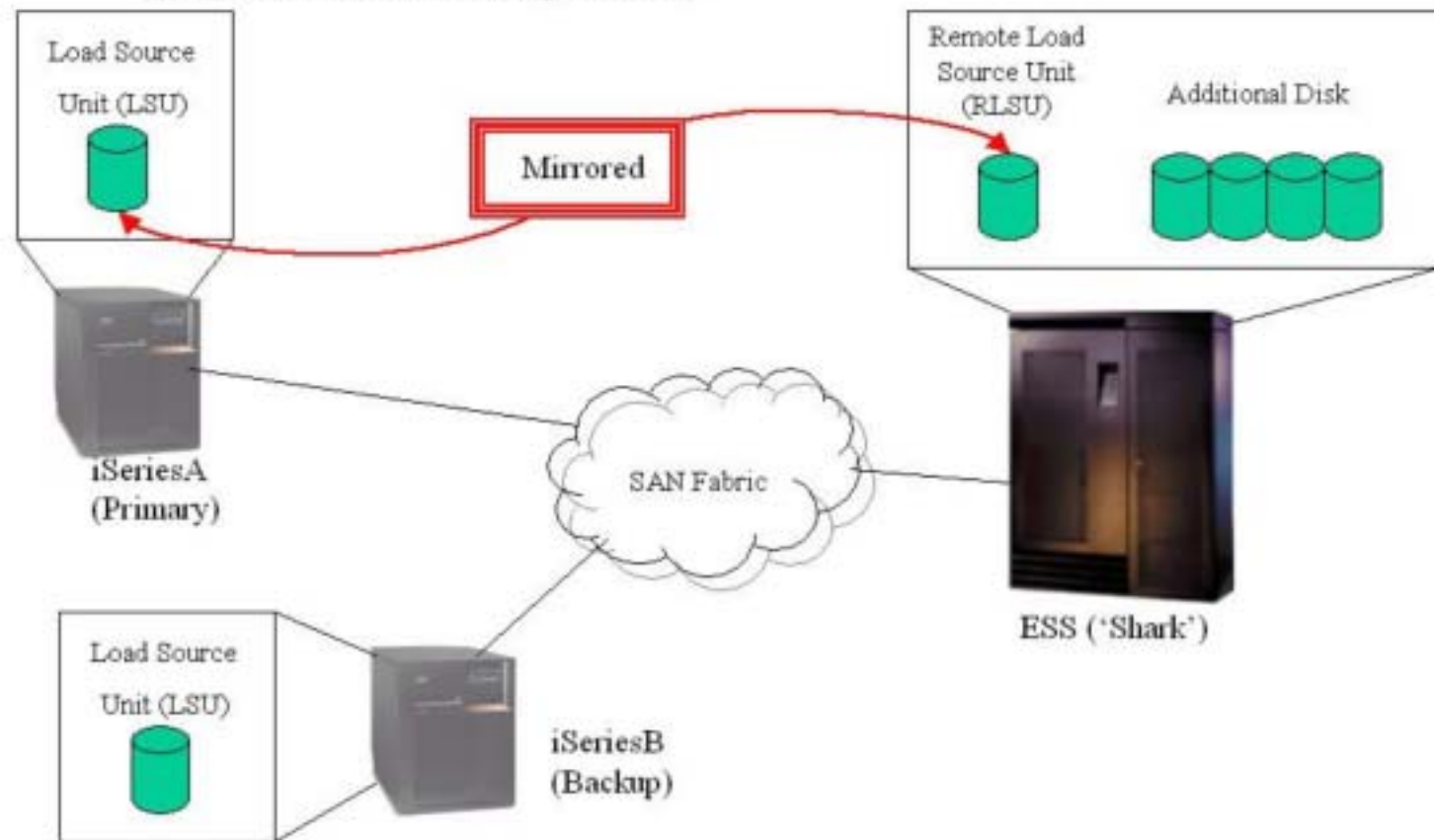


# ESS System Recovery

- **System A**
  - Internal LSU mirrored to ESS
  - All other storage in ESS
- **System B**
  - Internal LSU



## Demonstration Configuration

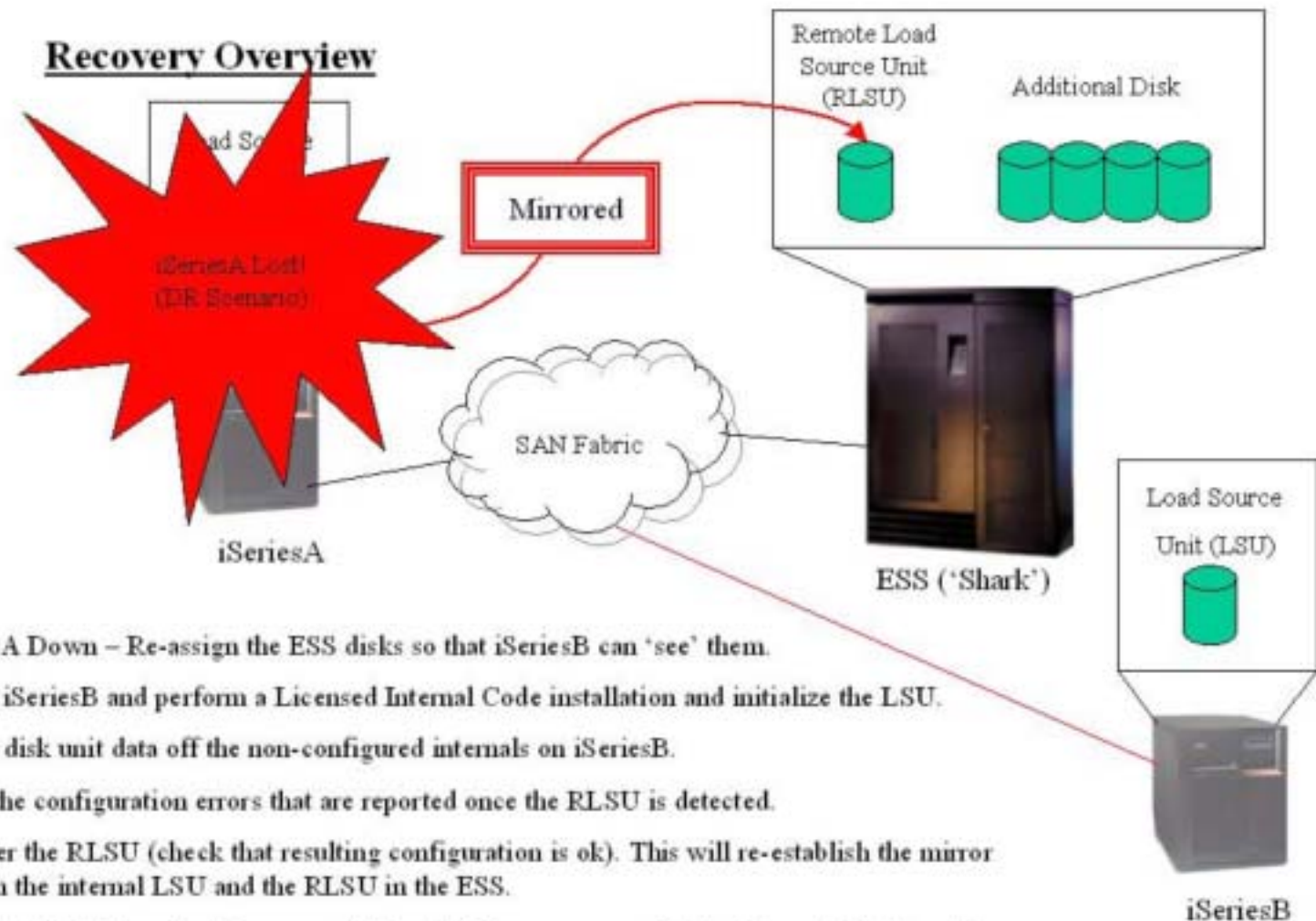


- System can be mirrored between internal and external disks if required or combination configurations can be used
- Load source mirroring is only required if the intention is to use the ESS as part of a Disaster Recovery process
- ESS based disks can be a combination of mirroring, RAID and unprotected
- If FlashCopy is to be used on the ESS for the iSeries then a complete copy of the ASP data needs to be in the ESS including the LSU



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## Recovery Overview



- iSeriesA Down – Re-assign the ESS disks so that iSeriesB can 'see' them.
- IPL-D iSeriesB and perform a Licensed Internal Code installation and initialize the LSU.
- Delete disk unit data off the non-configured internals on iSeriesB.
- Clear the configuration errors that are reported once the RLSU is detected.
- Recover the RLSU (check that resulting configuration is ok). This will re-establish the mirror between the internal LSU and the RLSU in the ESS.
- Complete the IPL and perform any additional disk recovery needed (such as establishing other mirrors that may exist in the recovered ASP).
- Change resource name assignments to match new hardware names.
- iSeriesB ready to use.

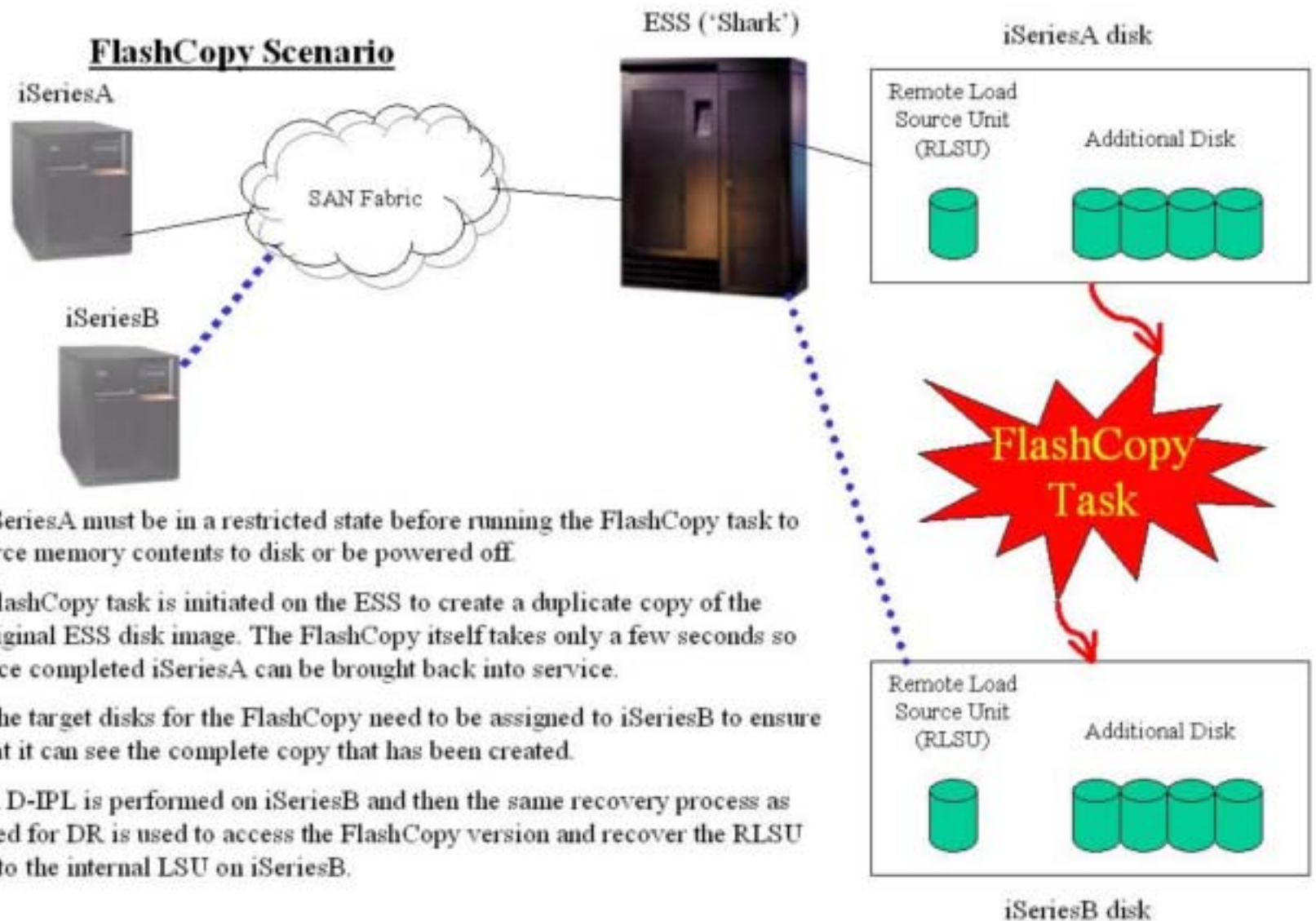


# Flashcopy Functionality

- Offsite Disaster Recovery – in conjunction with Peer to Peer Remote Copy (PPRC)
- Point in time data copies
- IASP functionality removes need for restrictive states and IPLs



## FlashCopy Scenario



- iSeriesA must be in a restricted state before running the FlashCopy task to force memory contents to disk or be powered off.

- FlashCopy task is initiated on the ESS to create a duplicate copy of the original ESS disk image. The FlashCopy itself takes only a few seconds so once completed iSeriesA can be brought back into service.

- The target disks for the FlashCopy need to be assigned to iSeriesB to ensure that it can see the complete copy that has been created.

- A D-IPL is performed on iSeriesB and then the same recovery process as used for DR is used to access the FlashCopy version and recover the RLSU onto the internal LSU on iSeriesB.



# The Right Solution

- Consider
  - Consolidation
  - Internal or External storage
  - Costs
  - Functionality



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